REMARKS

Claims 1 through 49 are extant in the case.

Claims 2, 7, 11, 12, 18, 24, 29, 33, 38 and 45 through 47 are objected to as being dependent on a rejected base claim.

Claims 1, 3 through 6, 8 through 10, 13 through 17, 19 through 23, 25 through 28, 30 through 32, 34 through 37, 39 through 44, 48 and 49 have been rejected under 35 U.S.C. § 103 (a) as being unpatentable over USPN 6,474,772 (Kawamura) in view of Publication No. U.S. 2003/0058332 (Fujiwara). Applicant respectfully traverses the rejection and requests reconsideration.

Applicant has amended claim 36 to correct a typographic error.

Criteria for a Rejection under 35 U.S.C. § 103(a)

The U.S. Patent and Trademark Office has set forth a methodology for establishing a *prima facie* case of obviousness. Specifically three basic criteria must be met.

> First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

See MPEP 706.02 (j).

Appellant believes the Examiner has failed to establish a *prima facie* case of obviousness for the claims extant in the present case because there are claim limitations that are not taught or suggested by any of the cited references.

Below, Applicant points out subject matter within each independent claim that is not disclosed by the cited art. On the basis of this, Applicant believes all the claims are patentable over the cited art

Discussion of Independent Claim 1

Claim 1 sets out a method for determining a turn-on energy of a printhead. The printhead is fired at a first firing frequency over an initial range of print energies to detect an approximate range of print energies in which the turn-on energy is located. Then, the printhead is fired at a second firing frequency over the approximate range of print energies in which the turn-on energy is located in order to determine a value for the turn-on energy of the printhead. The second firing frequency is higher than the first firing frequency. Neither Kawamura nor Fujiwara disclose the second step of claim 1 where the printhead is fired at a second firing frequency.

Examiner has conceded that Kawamura does not disclose the second step of claim 1 where the printhead is fired at a second firing frequency. Examiner has argued that Fujiwara's use of finer intervals of laser intensity discloses this second step of claim 1. Applicant respectfully disagrees.

In claim 1, there are two variables used to determine turn-on energy. These are (1) print energy and (2) firing frequency.

When determining turn-on energy, Kawamura does not vary firing frequency to determine turn-on energy. Thus Kawamura does not disclose the second step of claim 1.

Likewise, when Fujiwara determines maximum intensity for irradiating laser light to the surface of a photo receptor, *only one variable* is utilized: laser intensity. In both steps of Fujiwara's two-step *only laser intensity is varied.* The difference between the first step and the second step of Fujiwara is not that another variable is used, but only that *the size of the intervals between laser intensity values* is varied. In essence, Fujiwara is using a coarse adjustment (with intervals of a larger size) and fine adjustment (within intervals of a smaller size). See, for example, blocks S3 and S7 of Figure 1. Nevertheless, Fujiwara only changes one variable: laser intensity.

Applying the teaching of Fujiwara to Kawamura, one might arrive at a two-step process; however, the two-step process would not resemble the present invention. For example, a two-step process resulting from a combination Fujiwara to Kawamura might result in testing print energies using a coarse adjustment (with intervals of a larger size) and then testing print energies using a fine adjustment (within intervals of a smaller size).

However, nothing in Fujiwara or Kawamura would suggest to a person of ordinary skill in the art that the *firing frequency* of the printhead should be changed when conducting a test to determine turn-on energy of a printhead. This changing of the firing frequency in the second step of claim 1 is a unique contribution to the art, not disclosed or suggested by a combination of Kawamura and Fujiwara.

Nothing in Fujiwara (whether considered alone or in combination with Kawamura) discloses or suggests using a second firing frequency over an

approximate range of print energies in which turn-on energy is located in order to determine a value for the turn-on energy of a printhead. Fujiwara only teaches using a coarse adjustment (with intervals of a larger size) and fine adjustment (within intervals of a smaller size) when determining a maximum laser intensity for a given purpose. This does not disclose or suggest the second step of claim 1 where the printhead is fired at a second firing frequency.

Discussion of Independent Claim 10

Claim 10 sets out a method for determining a turn-on energy of a printhead. The printhead is fired at a first firing frequency over an initial range of print energies to detect an approximate range of print energies in which the turn-on energy is located. Then, the printhead is fired at a second firing frequency over the approximate range of print energies in which the turn-on energy is located in order to determine a value for the turn-on energy of the printhead. Neither Kawamura nor Fujiwara disclose the second step of claim 10 where the printhead is fired at a second firing frequency.

As discussed above, Examiner has conceded that Kawamura does not disclose the second step of claim 10 where the printhead is fired at a second firing frequency. Examiner has argued that Fujiwara's use of finer intervals of laser intensity discloses this second step of claim 10. Applicant respectfully disagrees.

In claim 10, there are two variables used to determine turn-on energy. These are (1) print energy and (2) firing frequency.

When determining turn-on energy, Kawamura does not vary firing frequency to determine turn-on energy. Thus Kawamura does not disclose the second step of claim 10.

Likewise, when Fujiwara determines maximum intensity for irradiating laser light to the surface of a photo receptor, *only one variable* is utilized: laser intensity. In both steps of Fujiwara's two-step *only laser intensity is varied.* The difference between the first step and the second step of Fujiwara is not that another variable is used, but only that *the size of the intervals between laser intensity values* is varied. In essence, Fujiwara is using a coarse adjustment (with intervals of a larger size) and fine adjustment (within intervals of a smaller size). See, for example, blocks S3 and S7 of Figure 1. Nevertheless, Fujiwara only changes one variable: laser intensity.

Applying the teaching of Fujiwara to Kawamura, one might arrive at a two-step process; however, the two-step process would not resemble the present invention. For example, a two-step process resulting from a combination Fujiwara to Kawamura might result in testing print energies using a coarse adjustment (with intervals of a larger size) and then testing print energies using a fine adjustment (within intervals of a smaller size).

However, nothing in Fujiwara or Kawamura would suggest to a person of ordinary skill in the art that the *firing frequency* of the printhead should be changed when conducting a test to determine turn-on energy of a printhead. This changing of the firing frequency in the second step of claim 10 is a unique

contribution to the art, not disclosed or suggested by a combination of Kawamura and Fujiwara.

Nothing in Fujiwara (whether considered alone or in combination with Kawamura) discloses or suggests using a second firing frequency over an approximate range of print energies in which turn-on energy is located in order to determine a value for the turn-on energy of a printhead. Fujiwara only teaches using a coarse adjustment (with intervals of a larger size) and fine adjustment (within intervals of a smaller size) when determining a maximum laser intensity for a given purpose. This does not disclose or suggest the second step of claim 10 where the printhead is fired at a second firing frequency.

Discussion of Independent Claim 16

Claim 16 sets out a device that includes a printhead and a controller. The controller determines a turn-on energy of the printhead by causing the printhead to fire ink at a first firing frequency over an initial range of print energies to detect an approximate range of print energies in which the turn-on energy is located, and by causing the printhead to fire ink at a second firing frequency over the approximate range of print energies in which the turn-on energy is located in order to determine a value for the turn-on energy of the printhead. Neither Kawamura nor Fujiwara disclose causing the printhead to fire ink at a second firing frequency over the approximate range of print energies.

As discussed above, Examiner has conceded that Kawamura does not disclose firing the printhead at a second firing frequency over the approximate range of print energies. Examiner has argued that Fujiwara's use of finer intervals of laser intensity discloses this. Applicant respectfully disagrees.

In claim 16, there are two variables used to determine turn-on energy. These are (1) print energy and (2) firing frequency.

When determining turn-on energy, Kawamura does not vary firing frequency to determine turn-on energy. Thus Kawamura does not disclose this subject matter contained in claim 16.

Likewise, when Fujiwara determines maximum intensity for irradiating laser light to the surface of a photo receptor, only one variable is utilized: laser intensity. In both steps of Fujiwara's two-step only laser intensity is varied. The difference between the first step and the second step of Fujiwara is not that another variable is used, but only that the size of the intervals between laser intensity values is varied. In essence, Fujiwara is using a coarse adjustment (with intervals of a larger size) and fine adjustment (within intervals of a smaller size). See, for example, blocks S3 and S7 of Figure 1. Nevertheless, Fujiwara only changes one variable: laser intensity.

Applying the teaching of Fujiwara to Kawamura, one might arrive at a two-step process; however, the two-step process would not resemble the present invention. For example, a two-step process resulting from a combination Fujiwara to Kawamura might result in testing print energies using a coarse

adjustment (with intervals of a larger size) and then testing print energies using a fine adjustment (within intervals of a smaller size).

However, nothing in Fujiwara or Kawamura would suggest to a person of ordinary skill in the art that the firing frequency of the printhead should be changed when conducting a test to determine turn-on energy of a printhead. This changing of the firing frequency as set out claim 16 is a unique contribution to the art, not disclosed or suggested by a combination of Kawamura and Fujiwara.

Nothing in Fujiwara (whether considered alone or in combination with Kawamura) discloses or suggests using a second firing frequency over an approximate range of print energies in which turn-on energy is located in order to determine a value for the turn-on energy of a printhead. Fujiwara only teaches using a coarse adjustment (with intervals of a larger size) and fine adjustment (within intervals of a smaller size) when determining a maximum laser intensity for a given purpose. This does not disclose or suggest firing a printhead at a second firing frequency over the approximate range of print energies, as set out in claim 16.

Discussion of Independent Claim 27

Claim 27 sets out a device that includes a printhead and a controller. The controller determines a turn-on energy of the printhead by causing the printhead to fire ink at a first firing frequency over an initial range of print energies to detect an approximate range of print energies in which the turn-on

energy is located, and by causing the printhead to fire ink at a second firing frequency over the approximate range of print energies in which the turn-on energy is located in order to determine a value for the turn-on energy of the printhead. Neither Kawamura nor Fujiwara disclose causing the printhead to fire ink at a second firing frequency over the approximate range of print energies.

As discussed above, Examiner has conceded that Kawamura does not disclose firing the printhead at a second firing frequency over the approximate range of print energies. Examiner has argued that Fujiwara's use of finer intervals of laser intensity discloses this. Applicant respectfully disagrees.

In claim 27, there are two variables used to determine turn-on energy. These are (1) print energy and (2) firing frequency.

When determining turn-on energy, Kawamura does not vary firing frequency to determine turn-on energy. Thus Kawamura does not disclose this subject matter contained in claim 27.

Likewise, when Fujiwara determines maximum intensity for irradiating laser light to the surface of a photo receptor, only one variable is utilized: laser intensity. In both steps of Fujiwara's two-step only laser intensity is varied. The difference between the first step and the second step of Fujiwara is not that another variable is used, but only that the size of the intervals between laser intensity values is varied. In essence, Fujiwara is using a coarse adjustment (with intervals of a larger size) and fine adjustment (within intervals of a

smaller size). See, for example, blocks S3 and S7 of Figure 1. Nevertheless, Fujiwara only changes one variable: laser intensity.

Applying the teaching of Fujiwara to Kawamura, one might arrive at a two-step process; however, the two-step process would not resemble the present invention. For example, a two-step process resulting from a combination Fujiwara to Kawamura might result in testing print energies using a coarse adjustment (with intervals of a larger size) and then testing print energies using a fine adjustment (within intervals of a smaller size).

However, nothing in Fujiwara or Kawamura would suggest to a person of ordinary skill in the art that the firing frequency of the printhead should be changed when conducting a test to determine turn-on energy of a printhead. This changing of the firing frequency as set out claim 27 is a unique contribution to the art, not disclosed or suggested by a combination of Kawamura and Fujiwara.

Nothing in Fujiwara (whether considered alone or in combination with Kawamura) discloses or suggests using a second firing frequency over an approximate range of print energies in which turn-on energy is located in order to determine a value for the turn-on energy of a printhead. Fujiwara only teaches using a coarse adjustment (with intervals of a larger size) and fine adjustment (within intervals of a smaller size) when determining a maximum laser intensity for a given purpose. This does not disclose or suggest firing a printhead at a second firing frequency over the approximate range of print energies, as set out in claim 27.

Discussion of Independent Claim 36

Claim 36 sets out a device that includes a means of ejecting ink and a means for controlling the ejection of ink. The means for controlling the ejection of ink determines a turn-on energy of the printhead by causing the printhead to fire ink at a first firing frequency over an initial range of print energies to detect an approximate range of print energies in which the turn-on energy is located, and by causing the printhead to fire ink at a second firing frequency over the approximate range of print energies in which the turn-on energy is located in order to determine a value for the turn-on energy of the printhead. Neither Kawamura nor Fujiwara disclose causing the printhead to fire ink at a second firing frequency over the approximate range of print energies.

As discussed above, Examiner has conceded that Kawamura does not disclose firing the printhead at a second firing frequency over the approximate range of print energies. Examiner has argued that Fujiwara's use of finer intervals of laser intensity discloses this. Applicant respectfully disagrees.

In claim 36, there are two variables used to determine turn-on energy. These are (1) print energy and (2) firing frequency.

When determining turn-on energy, Kawamura does not vary firing frequency to determine turn-on energy. Thus Kawamura does not disclose this subject matter contained in claim 36.

Likewise, when Fujiwara determines maximum intensity for irradiating laser light to the surface of a photo receptor, only one variable is utilized: laser

intensity. In both steps of Fujiwara's two-step only laser intensity is varied. The difference between the first step and the second step of Fujiwara is not that another variable is used, but only that the size of the intervals between laser intensity values is varied. In essence, Fujiwara is using a coarse adjustment (with intervals of a larger size) and fine adjustment (within intervals of a smaller size). See, for example, blocks S3 and S7 of Figure 1. Nevertheless, Fujiwara only changes one variable: laser intensity.

Applying the teaching of Fujiwara to Kawamura, one might arrive at a two-step process; however, the two-step process would not resemble the present invention. For example, a two-step process resulting from a combination Fujiwara to Kawamura might result in testing print energies using a coarse adjustment (with intervals of a larger size) and then testing print energies using a fine adjustment (within intervals of a smaller size).

However, nothing in Fujiwara or Kawamura would suggest to a person of ordinary skill in the art that the firing frequency of the printhead should be changed when conducting a test to determine turn-on energy of a printhead. This changing of the firing frequency as set out claim 36 is a unique contribution to the art, not disclosed or suggested by a combination of Kawamura and Fujiwara.

Nothing in Fujiwara (whether considered alone or in combination with Kawamura) discloses or suggests using a second firing frequency over an approximate range of print energies in which turn-on energy is located in order to determine a value for the turn-on energy of a printhead. Fujiwara only

teaches using a coarse adjustment (with intervals of a larger size) and fine adjustment (within intervals of a smaller size) when determining a maximum laser intensity for a given purpose. This does not disclose or suggest firing a printhead at a second firing frequency over the approximate range of print energies, as set out in claim 36.

Discussion of Independent Claim 37

Claim 37 sets out storage media that stores programming which when executed on a printing device, performs a method for determining a turn-on energy of a printhead. The printhead is fired at a first firing frequency over an initial range of print energies to detect an approximate range of print energies in which the turn-on energy is located. Then, the printhead is fired at a second firing frequency over the approximate range of print energies in which the turn-on energy is located in order to determine a value for the turn-on energy of the printhead. Neither Kawamura nor Fujiwara disclose the second step of claim 37 where the printhead is fired at a second firing frequency.

As discussed above, Examiner has conceded that Kawamura does not disclose the second step of claim 37 where the printhead is fired at a second firing frequency. Examiner has argued that Fujiwara's use of finer intervals of laser intensity discloses this second step of claim 37. Applicant respectfully disagrees.

In claim 37, there are two variables used to determine turn-on energy. These are (1) print energy and (2) firing frequency.

When determining turn-on energy, Kawamura does not vary firing frequency to determine turn-on energy. Thus Kawamura does not disclose the second step of claim 37.

Likewise, when Fujiwara determines maximum intensity for irradiating laser light to the surface of a photo receptor, only one variable is utilized: laser intensity. In both steps of Fujiwara's two-step only laser intensity is varied. The difference between the first step and the second step of Fujiwara is not that another variable is used, but only that the size of the intervals between laser intensity values is varied. In essence, Fujiwara is using a coarse adjustment (with intervals of a larger size) and fine adjustment (within intervals of a smaller size). See, for example, blocks S3 and S7 of Figure 1. Nevertheless, Fujiwara only changes one variable: laser intensity.

Applying the teaching of Fujiwara to Kawamura, one might arrive at a two-step process; however, the two-step process would not resemble the present invention. For example, a two-step process resulting from a combination Fujiwara to Kawamura might result in testing print energies using a coarse adjustment (with intervals of a larger size) and then testing print energies using a fine adjustment (within intervals of a smaller size).

However, nothing in Fujiwara or Kawamura would suggest to a person of ordinary skill in the art that the firing frequency of the printhead should be changed when conducting a test to determine turn-on energy of a printhead. This changing of the firing frequency in the second step of claim 37 is a unique

contribution to the art, not disclosed or suggested by a combination of Kawamura and Fujiwara.

Nothing in Fujiwara (whether considered alone or in combination with Kawamura) discloses or suggests using a second firing frequency over an approximate range of print energies in which turn-on energy is located in order to determine a value for the turn-on energy of a printhead. Fujiwara only teaches using a coarse adjustment (with intervals of a larger size) and fine adjustment (within intervals of a smaller size) when determining a maximum laser intensity for a given purpose. This does not disclose or suggest the second step of claim 37 where the printhead is fired at a second firing frequency.

Discussion of Independent Claim 44

Claim 44 sets out storage media that stores programming which when executed on a printing device, performs a method for determining a turn-on energy of a printhead. The printhead is fired at a first firing frequency over an initial range of print energies to detect an approximate range of print energies in which the turn-on energy is located. Then, the printhead is fired at a second firing frequency over the approximate range of print energies in which the turn-on energy is located in order to determine a value for the turn-on energy of the printhead. Neither Kawamura nor Fujiwara disclose the second step of claim 44 where the printhead is fired at a second firing frequency.

As discussed above, Examiner has conceded that Kawamura does not disclose the second step of claim 44 where the printhead is fired at a second

firing frequency. Examiner has argued that Fujiwara's use of finer intervals of laser intensity discloses this second step of claim 44. Applicant respectfully disagrees.

In claim 44, there are two variables used to determine turn-on energy. These are (1) print energy and (2) firing frequency.

When determining turn-on energy, Kawamura does not vary firing frequency to determine turn-on energy. Thus Kawamura does not disclose the second step of claim 44.

Likewise, when Fujiwara determines maximum intensity for irradiating laser light to the surface of a photo receptor, only one variable is utilized: laser intensity. In both steps of Fujiwara's two-step only laser intensity is varied. The difference between the first step and the second step of Fujiwara is not that another variable is used, but only that the size of the intervals between laser intensity values is varied. In essence, Fujiwara is using a coarse adjustment (with intervals of a larger size) and fine adjustment (within intervals of a smaller size). See, for example, blocks S3 and S7 of Figure 1. Nevertheless, Fujiwara only changes one variable: laser intensity.

Applying the teaching of Fujiwara to Kawamura, one might arrive at a two-step process; however, the two-step process would not resemble the present invention. For example, a two-step process resulting from a combination Fujiwara to Kawamura might result in testing print energies using a coarse adjustment (with intervals of a larger size) and then testing print energies using a fine adjustment (within intervals of a smaller size).

However, nothing in Fujiwara or Kawamura would suggest to a person of ordinary skill in the art that the firing frequency of the printhead should be changed when conducting a test to determine turn-on energy of a printhead. This changing of the firing frequency in the second step of claim 44 is a unique contribution to the art, not disclosed or suggested by a combination of Kawamura and Fujiwara.

Nothing in Fujiwara (whether considered alone or in combination with Kawamura) discloses or suggests using a second firing frequency over an approximate range of print energies in which turn-on energy is located in order to determine a value for the turn-on energy of a printhead. Fujiwara only teaches using a coarse adjustment (with intervals of a larger size) and fine adjustment (within intervals of a smaller size) when determining a maximum laser intensity for a given purpose. This does not disclose or suggest the second step of claim 44 where the printhead is fired at a second firing frequency.

Conclusion

Applicant believes the present case is in condition for allowance and favorable action is respectfully requested.

Respectfully submitted,

DUANE KOEHLER
VOLKER SMEKTALA

By 
Douglas L. Weller
Reg. No. 30,506

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Santa Clara, California
(408) 985-0642